

## CLAIMS

1. A production method of synthetic silica glass comprising:

5 a first step of ejecting a silicon compound and a combustion gas containing oxygen and hydrogen from a burner to hydrolyze the silicon compound in oxyhydrogen flame to produce fine particles of silica glass and thereafter depositing and vitrifying said fine particles of silica glass on a target opposed to said burner to obtain a synthetic silica glass ingot;

10 a second step of heating the synthetic silica glass ingot obtained in the first step or a synthetic silica glass block obtained by cutting of said synthetic silica glass ingot, up to a first retention temperature within a range of not less than 900°C, retaining the ingot or the block at the first retention temperature for a predetermined time, and thereafter cooling the ingot or the block at a temperature decrease rate of not more than 10°C/h down to a temperature of not more than 500°C; and

20 a third step of heating the synthetic silica glass ingot or the synthetic silica glass block obtained in the second step, up to a second retention temperature within a range of not less than 500°C nor more than 1100°C, retaining the ingot or the block at the second retention temperature for a predetermined

time, and thereafter cooling the ingot or the block at a temperature decrease rate of not less than 50°C/h down to a temperature 100°C lower than said second retention temperature.

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2. A production method of synthetic silica glass according to Claim 1, wherein the temperature decrease rate in the third step is not less than 70°C/h nor more than 800°C/h.

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3. A production method of synthetic silica glass according to Claim 1, wherein a common furnace is used in the second step and in the third step, and the third step is carried out continuously without taking the synthetic silica glass ingot or the synthetic silica glass block out of the furnace, after the second step.

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4. A production method of synthetic silica glass according to Claim 1, wherein said third step comprises a step of successively carrying out the heating, retaining, and cooling with rotating the synthetic silica glass ingot or the synthetic silica glass block.

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5. A thermal treatment apparatus comprising:  
a furnace of a refractory;  
a stage capable of carrying synthetic silica

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glass and moving between a first stage position for letting the synthetic silica glass into the furnace and a second stage position for letting said synthetic silica glass out of the furnace;

5           a heat generator for heating said synthetic silica glass; and

          a driving section connected to said stage, for moving said stage between said first stage position and said second stage position.

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6. A thermal treatment apparatus according to Claim 5, further comprising a rotational driving section for rotating said stage.